

U.S. Patent Application No.: 09/308,770

Art Unit: 1762

Page 8

REMARKS

Pending Claims

Claim 1 has been cancelled without prejudice to filing the subject matter in one or more continuation applications. Claims 2-5 were cancelled in a previous amendment. Claims 19 and 23 have been allowed. Claims 6-18, 20-22, and 24 have been amended to depend from allowed claim 19. New claims 25-41 have been added. Claim 25 includes the subject matter of claim 1 and recites a process for preparing organically modified, permanently hydrophobic aerogel comprising steps a-e, with the proviso that fibers are not added in step a). Support for this new claim can be found, for example, on page 14 (first paragraph), page 17 (second paragraph), and original claim 7. Claims 26-41 include the subject matter of claims 6-18, 20-22, and 24 and depend either directly or indirectly from new claim 25. No new matter has been added. Thus, claims 6-41 are pending.

Summary of the Invention

The present invention relates to a process for preparing organically modified, permanently hydrophobic aerogels.

Rejection of Claims under 35 U.S.C. § 103(a)

The Examiner has rejected the claims 1, 6-18, 20-22, and 24 as being unpatentable over WO 96/06809 in view of Lentz (U.S. Patent No. 3,122,520). Frank et al. (U.S. Patent No. 5,866,027) is used as a working copy of WO 96/06809.

In paragraph 5 of the Office Action, the Examiner states that WO 96/06809 discloses a process for the preparation of organically modified aerogels comprising the steps of claim 1. The

U.S. Patent Application No.: 09/308,770

Art Unit: 1762

Page 9

Examiner further states that this reference teaches that a surface-silylating substance is used, whereby surface-modifying substances of the general formula R'_nMX_m are used to replace original surface groups with inert groups of the type MR'_n . The Examiner also states that where X is a radical $-OR''$, the surface modifying substance is a siloxane.

The Examiner finds that WO 96/06809 lacks the teaching of using a *disiloxane* of the formula of the present claims. However, the Examiner believes that the list of surface-modifying substances that are shown is exemplary and that one skilled in the art would have been motivated to look to the prior art for other surface-modifying substances that may be used in its invention.

The Examiner therefore relies on Lentz, et al. for its teaching of organosilicon compounds that may be used as surface-silylating/modifying substances for a hydrogel compound that is subsequently washed free of water and dried. The Examiner states that Lentz et al. teaches that the organosilicon compounds react with the original surface groups of a hydrogel according to the same reaction and overlap those of WO 96/06809, including the use of trimethylchlorosilane. The Examiner further states that Lentz et al. also teaches the use of disiloxanes of the claimed formula, including hexaethyldisiloxane and hexamethyldisiloxane. The Examiner therefore concludes that it would have been obvious to one having ordinary skill in the art, seeing WO 96/06809 and Lentz et al. in combination, to have substituted any of the surface-silylating substances of Lentz et al., including hexaethyldisiloxane or hexamethyldisiloxane, as the surface-silylating substance in the invention of WO 96/06809 with the expectation of successful results since WO 96/06809 and Lentz et al. teach the organosilicon compounds are for the same purpose, are similarly for use in forming aerogels, and react according to the same reaction.

Regarding claims 6-8, 18, 20, and 24, the Examiner states that WO 96/06809 additionally teaches steps of aging aerogels, adding fibers, increasing the mechanical stability of aerogels, and subcritical drying. Regarding claims 9 and 10, the Examiner states that WO 96/06809 teaches washing until the water content is less than or equal to 5 wt% and also teaches aliphatic or aromatic solvents. Regarding claim 17 and 21, the Examiner states that the solvent for washing is protic or

U.S. Patent Application No.: 09/308,770

Art Unit: 1762

Page 10

aprotic and includes aliphatic alcohols. Finally, regarding claims 15 and 22, the Examiner states that Lentz et al. teaches reacting the hydrogel with the surface modifying organosilicon compound in the presence of a strong acid catalyst and concludes that it would have been obvious to have used a catalyst in the method of WO 96/06809 in order to increase the speed of the surface-modifying reaction with the expectation of successful results upon seeing the Lentz et al. reference since the reaction of WO 96/06809 and Lentz et al. are similar.

Applicant respectfully disagrees. Regarding claim 1, this claim has been cancelled without prejudice to filing the subject matter in one or more continuation applications, making the rejection of this claim moot.

Regarding claims 6-18, 20-22, and 24, these claims have been amended to depend either directly or indirectly from allowed claim 19. Therefore, claims 6-18, 20-22, and 24 contain the same features of an allowed claim and recite further embodiments of the invention. Applicant therefore believes these claims should also be in condition for allowance and respectfully requests that the rejection of unpatentability in view of WO 96/06809 in view of Lentz et al. be withdrawn.

Regarding new claims 25-42, claim 25 recites a process for the preparation of organically modified aerogels with permanently hydrophobic surface groups. The process comprises steps a-e in which a surface-silylating agent comprising a disiloxane of formula I is used, with the proviso that fibers are not added in step a). This proviso is supported, for example, on page 14 (first paragraph) and page 17 (second paragraph) of the present application which states that fibers can be added during the preparation of the sol in order to increase the mechanical stability of the resulting gel. Claim 25 recites that this optional step is not used.

By comparison, WO 96/06809 (and Frank et al.), in part, describes a process for preparing fiber-reinforced xerogels. The method comprises the steps of preparing a sol, adding fibers to the sol, converting the sol to a gel, optionally exchanging the liquid in the gel, surface silylating, optionally exchanging the liquid in the gel, and drying. The stated objective of the invention of WO 96/06809 is to produce "mechanically stable xerogels", which is achieved when "fibers are

U.S. Patent Application No.: 09/308,770

Art Unit: 1762

Page 11

incorporated into the sol in suitable form and amount" (see column 1, line 60 to column 2, line 4). Thus, without a step of adding fibers, the stated objective could not be achieved.

Present claim 25 does not include this essential step and is therefore patentable over this reference. Furthermore, any combination of WO 96/06809 with Lentz et al. would also have to include the step of adding fibers. Therefore, Applicant believes that new claim 25 is patentable over WO 96/06809 in view of Lentz et al. Furthermore, claims 26-41, which depend directly or indirectly from claim 25, recite further embodiments of the present invention and, for at least the reasons discussed above, are also patentable over this combination of references. Applicant therefore believes that new claims 25-41 are patentable over WO 96/06809 in view of Lentz et al.

Conclusion

In view of the foregoing remarks, Applicant believes that this application is considered to be in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would further expedite the prosecution of the subject application, the Examiner is invited to call the undersigned.

Respectfully submitted,



Date: May 31, 2005

Robert M. Amici
Reg. No. 52,554
CABOT CORPORATION
Law Department
157 Concord Road
Billerica, MA 01821
(978) 670-6191

10/25/05 11:47 AM response 2